

# PATENT ABSTRACTS OF JAPAN

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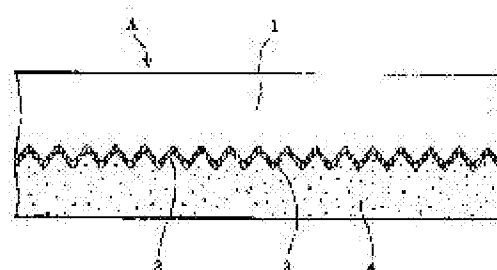
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## (54) ADHESIVE TAPE WITH DIFFRACTION GRATING PATTERN

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To obtain an adhesive tape which can prevent the damage caused by forgeries or imitations and enables the attributes of commodities to be distinguished by forming a light-reflecting vapor-deposited metal layer and an adhesive layer, subsequently in this order, on the surface of a diffraction grating pattern formed by embossing on one side of a substrate tape made of an ecologically tolerable plastic.

**SOLUTION:** A diffraction grating pattern 2 is formed on one side of a substrate tape made of an ecologically tolerable plastic, such as poly-L-lactic acid, by heating and pressing with an emboss roll or emboss plate having an emboss pattern, formed thereon, for embossing a diffraction grating pattern, such as a hologram image pattern, by photolithography (or photoetching) or engraving. A vapor-deposited metal layer 3 is formed as a light-reflecting layer on the surface of the diffraction pattern 2, and an adhesive layer 4 is formed thereon preferably from a pressure-sensitive, a heat-sensitive, or a remoistenable adhesive.



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## CLAIMS

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[Claim(s)]

[Claim 1]Adhesive tape with a diffraction grating pattern, wherein an adhesives layer is laminated by this order in a light reflex nature metal deposition layer and this deposition layer side at the surface of a diffraction grating pattern which carried out embossing formation at one side of a film base made from a plastic corresponding to ecology.

[Claim 2]That an adhesives layer is laminated by this order in a light reflex nature metal deposition layer and this deposition layer side at the surface of a diffraction grating pattern which carried out embossing formation, and this diffraction grating pattern on the surface of the diffraction grating pattern formative layer laminated on one side of a film base made from a plastic corresponding to ecology. Adhesive tape with a diffraction grating pattern by which it is characterized.

[Claim 3]The adhesive tape with a diffraction grating pattern according to claim 1 or 2 in which said adhesives layer is formed using a pressure sensitivity type, thermo-sensitive adhesives, or re-\*\*\* type adhesives.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application]When this invention is directly stuck on various goods or packs these goods about adhesive tape provided with diffraction grating patterns, such as a hologram, it relates to the adhesive tape with a diffraction grating pattern used sticking on wrapping paper, a container, etc.

[0002]

[Description of the Prior Art]To the conventional adhesive tape used sticking on wrapping paper, a container, etc. when stick on various goods directly, packing these goods or packing up. There are a transparent cellophane tape and colored cellophane tape, a cellophane tape in which printing displays, such as a brand of the target product and a trade name, were carried out especially, etc.

[0003]The adhesive tape in which the printing display of a brand, a trade name, etc. of the above target products was carried out is used also as a discernment tool in which the brand nature and the various attributes of the product are shown.

[0004]

[Problem(s) to be Solved by the Invention]However, since such conventional adhesive tape will be forged comparatively simply, it was not provided with the function as a sign tool to identify the commodity attribute for stopping the damage of a counterfeit, an imitation, etc.

[0005]When this invention packs goods or packs up, it is adhesive tape used sticking on wrapping paper, a container, etc., and it is to enable it to function as the discernment tool in which the brand nature of the goods for stopping the damage of a counterfeit, an imitation, etc. and the specific attribute of goods are shown.

[0006]

[Means for Solving the Problem]An invention concerning claim 1 of this invention is adhesive tape with a diffraction grating pattern, wherein an adhesives layer is laminated by this order in a light reflex nature metal deposition layer and this deposition layer side at the surface of a diffraction grating pattern which carried out embossing formation at one side of a film base made from a plastic corresponding to ecology.

[0007]Next, an invention concerning claim 2 of this invention, That an adhesives layer is laminated by this order in a light reflex nature metal deposition layer and this deposition layer side at the surface of a diffraction grating pattern which carried out embossing formation, and this diffraction grating pattern on the surface of the diffraction grating pattern formative layer laminated on one side of a film base made from a

plastic corresponding to ecology. It is adhesive tape with a diffraction grating pattern by which it is characterized.

[0008]Next, an invention concerning claim 1 or claim 2 of this invention is adhesive tape with a diffraction grating pattern in which said adhesives layer is formed using pressure sensitivity type adhesives, thermo-sensitive adhesives, or re-<sup>\*\*</sup> type adhesives in above-mentioned claim 1 or the adhesive tape with a diffraction grating pattern according to claim 2.

[0009]

[Embodiment of the Invention]The adhesive tape with a diffraction grating pattern of the invention concerning claim 1 of this invention is explained in detail below according to an embodiment.

[0010]Drawing 1 is a sectional side elevation of the adhesive tape with diffraction grating pattern A, Embossing formation of names and marks, such as a trademark which shows one side of the transparent tape shape plastic film base material 1 made from a plastic corresponding to ecology the brand nature and the various attributes of a brand or its product, such as a trade name, a manufacturer name, etc. about goods, the various patterns, etc. is carried out as the diffraction grating pattern 2.

[0011]The film material used as the plastic film base material 1 corresponding to ecology, Fitness (or good to some extent) is equipped with the character in which embossing formation is possible for a detailed diffraction grating pattern, And it is appropriate to use the biodegradable plastic film material which can be decomposed automatically by a microorganism, ultraviolet rays, etc., For example, a poly L-lactic acid film etc. can be used, and if it is the film material which the embossing formation to fitness (or good to some extent) was possible in the detailed diffraction grating pattern as other materials, and was provided with biodegradability, it will not be limited in particular.

[0012]The diffraction grating pattern 2 with a photolitho method (or photo etching method) or an engraving method. a hologram image pattern (a rainbow hologram and a stereo hologram.) An Lippman-type hologram, a white photo-regenerating hologram, a laser beam reproduction hologram, The embossing roll or embossing plate in which the embossing-die pattern for carrying out embossing formation of diffraction grating patterns, such as a stereo hologram, and the other diffraction grating patterns was formed is used, Embossing formation is carried out by heat pressing at one side of the plastic film base material 1.

[0013]The metal deposition layer 3 with the light reflex nature of the proper thickness by aluminum etc. is given to the surface of said diffraction grating pattern 2 formed in one side of said plastic film base material 1 of transparent tape shape, and it functions on it as a light reflection layer.

[0014]And laminating formation of the adhesives layer 4 is carried out to the surface of said metal deposition layer 3 using water or oily pressure sensitivity type adhesives (binder), water or oily thermo-sensitive adhesives (fusing agent), or water re-<sup>\*\*</sup> type adhesives.

[0015]Next, the adhesive tape with a diffraction grating pattern of the invention concerning claim 2 of this invention is explained in detail below according to an embodiment.

[0016]Drawing 2 is a sectional side elevation of the adhesive tape with diffraction grating pattern B, On one side of the transparent tape shape plastic film base material 1 made from a plastic corresponding to ecology. Laminating formation is carried out by the diffraction grating pattern formative layer 12, and on the surface of this diffraction grating pattern formative layer 12. Embossing formation of names and marks, such as a trademark which shows the brand nature and the various attributes of a brand or its product, such as a trade name, a manufacturer name, etc. about goods, the various patterns, etc. is carried out as

the diffraction grating pattern 13 by said same heat pressing embossing method.

[0017]The diffraction grating pattern 13 with a photolitho method (or photo etching method) or an engraving method. Embossing formation is carried out by heat pressing at one side of the plastic film base material 1 using the embossing roll or embossing plate in which the embossing-die pattern for carrying out embossing formation of the diffraction grating patterns, such as a hologram image pattern, was formed.

[0018]The metal deposition layer 14 with the light reflex nature of the proper thickness by aluminum etc. is given to the surface of said diffraction grating pattern 13 formed in one side of said plastic film base material 1 of transparent tape shape, and it functions on it as a light reflection layer.

[0019]And laminating formation of the adhesives layer 15 is carried out to the surface of said metal deposition layer 14 using pressure sensitivity type adhesives (binder), thermo-sensitive adhesives (fusing agent), or re-<sup>\*\*</sup> type adhesives.

[0020]The plastic film material used as the film base 1 of adhesive tape B shown in drawing 2, It is a plastic corresponding to ecology at least, and what is necessary is just a plastic film which can be disassembled automatically by a microorganism or ultraviolet rays, Since laminating formation of the diffraction grating pattern formative layer 12 which equips fitness (or good to some extent) with the character in which embossing formation is possible is carried out in a diffraction grating pattern detailed as an interlayer, it is not necessary to necessarily use plastic film material with especially diffraction grating pattern embossing fitness.

[0021]As a material of said diffraction grating pattern formative layer 12, the plastic film which equips fitness (or good to some extent) with the character in which embossing formation is possible, and has biodegradability in a diffraction grating pattern at least is used, for example, a poly L-lactic acid film etc. can be used.

[0022]Adhesive tape [ of this invention explained above ] with diffraction grating pattern A and B, To the plastic film base material 1 of tape shape, with the diffraction grating pattern 2. Names and marks, such as a trademark which shows the brand nature and the various attributes of a brand or goods, such as a trade name, a manufacturer name, etc. about goods, various patterns, etc. are the tape shape adhesive tape by which the visible display was carried out, and are rolled round and formed in suitable paper winding shafts, such as a winding core, at rolled form at predetermined length.

[0023]Adhesive tape [ of this invention ] with diffraction grating pattern A and B, Visible displays, such as names and marks, such as a trademark which shows the brand nature and the various attributes of a brand or its product, such as a trade name, a manufacturer name, etc. about goods by the diffraction grating pattern 2, and various patterns, are observed from the film base 1 side of an opposite hand to the adhesives layers 4 and 15.

[0024]Adhesive tape [ of this invention ] with diffraction grating pattern A and B, Although diffraction grating patterns including a hologram are fabricated by adhesive tape and the adhesive tape made from a plastic film, for example, a formation indication of the image body itself which should be carried out a visible display, such as a specific character, a trademark, a pattern, and a mark, is given with a diffraction grating pattern, In addition, what indicated the image bodies which should be carried out a visible display, such as said specific character, a trademark, a pattern, and a mark, by image formation with the printing method, made the above-mentioned predetermined diffraction grating pattern overlap to the printing display field, and indicated by formation may be used.

[0025]

[Example]The concrete example of the adhesive tape of this invention is described below.

[0026]The poly L-lactic acid film (about 16 micrometers in thickness; made by Mitsui Chemicals, Inc.) of long shape transparent as a <Example 1> film base is introduced between an embossing roll and a press roll, After carrying out embossing formation of the diffraction grating pattern by a hologram pattern with an embossing roll at one side of the film base, Vacuum deposition of the aluminum of about 50 nm of thickness was carried out on the surface of the diffraction grating pattern, the metal deposition layer was formed, and coating of the acrylic adhesives (oily binder) was carried out to the surface of the metal deposition layer in about 80-micrometer coating thickness. Then, it rolled round to the rolling-up core after the seasoning for one week, carrying out a slit to 60-mm width, and adhesive tape A of this invention was created. After sticking this adhesive tape on the pasteboard for packing, when it buried in leaf mold and was neglected in 90% of environment at 60 \*\* by the state where it buried, it was checked that the hologram portion is decomposed in about two weeks.

[0027]On one side of the poly L-lactic acid film (about 16 micrometers in thickness; made by Mitsui Chemicals, Inc.) of long shape transparent as a <Example 2> film base. polyester urethane resin (blended resin of polyester urethane.) Coating of what added optimum dose of isocyanates to hardening to the copolymer resin, and was used as coating liquid was carried out in about 1.5-micrometer coating thickness, the diffraction grating pattern formative layer was formed, aging was performed for one week at 80 \*\* after that, and the film base was obtained. Then, this film base is introduced between an embossing roll and a press roll, After carrying out embossing formation of the diffraction grating pattern by a hologram pattern with an embossing roll on the surface of the diffraction grating pattern formative layer of the film base, Vacuum deposition of the aluminum of about 50 nm of thickness was carried out on the surface of the diffraction grating pattern, the metal deposition layer was formed, and coating of the acrylic emulsion adhesives (aquosity binder) was carried out to the surface of the metal deposition layer in about 80-micrometer coating thickness. Then, it rolled round to the rolling-up core after the seasoning for one week, carrying out a slit to 60-mm width, and adhesive tape B of this invention was created. After sticking this adhesive tape on the pasteboard for packing, when it buried in leaf mold and was neglected in 90% of environment at 60 \*\* by the state where it buried, it was checked that the hologram portion is decomposed in about two weeks.

[0028]On one side of the poly L-lactic acid film (about 16 micrometers in thickness; made by Mitsui Chemicals, Inc.) of long shape transparent as a <Example 3> film base. polyester urethane resin (blended resin of polyester urethane.) Coating of what added optimum dose of isocyanates to hardening to the copolymer resin, and was used as coating liquid was carried out in about 1.5-micrometer coating thickness, the diffraction grating pattern formative layer was formed, aging was performed for one week at 80 \*\* after that, and the film base was obtained. Then, this film base is introduced between an embossing roll and a press roll, After carrying out embossing formation of the diffraction grating pattern by a hologram pattern with an embossing roll on the surface of the diffraction grating pattern formative layer of the film base, Vacuum deposition of the aluminum of about 50 nm of thickness was carried out on the surface of the diffraction grating pattern, the metal deposition layer was formed, and coating of the acrylic emulsion adhesives (aquosity binder) was carried out to the surface of the metal deposition layer in about 80-micrometer coating thickness. Then, it rolled round to the rolling-up core after the seasoning for one week,

carrying out a slit to 60-mm width, and adhesive tape B of this invention was created. After sticking this adhesive tape on the pasteboard for packing, when it was neglected in ordinary temperature normal relative humidity and introduced into the recycling process of the paper of said pasteboard for packing about one week afterward, it was checked that the hologram portion is decomposed.

[0029]

[Effect of the Invention]The adhesive tape with a diffraction grating pattern of this invention, By diffraction grating patterns including a hologram being fabricated by adhesive tape and the adhesive tape made from a plastic film corresponding to ecology, and having a diffraction grating pattern, While the forgery prevention effect over the main part of adhesive tape of this invention is acquired, The adhesive tape of this invention which displayed the brand nature and the specific attribute of genuine goods, such as a specific character, a trademark, a pattern, and a mark, using the diffraction grating pattern, When it is used for a genuine article body, its wrapping paper, a container, etc., having stuck on them as a discernment tool, it comes to be able to perform discernment from genuine goods, and a counterfeit and an imitation easily, the security nature to genuine goods can be improved, and there is an effect which stops the trouble and damage caused by a counterfeit or an imitation.

[0030]Since the film base made from a plastic corresponding to the ecology which is a polymers plastic in which a solution is possible is used, when carrying out discarding treatment of the used adhesive tape, It lays underground into the ground and there are effects, like the discarding treatment which could carry out decomposition treatment by available light again, and considered the measure against prevention of pollution by the microorganism in the ground becomes possible.

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[Translation done.]